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REMARKS

Courtesies extended to Applicants' representative in the telephone interview had on May 18, 2006, are acknowledged with appreciation.

In the pending Office Action, claims 1 - 12 were rejected under § 103(a) as allegedly unpatentable over U.S. Patent No. 6,115,198 to Reed et al. in view of U.S. Patent No. 6,487,032 to Cloke et al.

Applicants respectfully traverse each of the rejections and respectfully request reconsideration of this application in light of the following remarks.

The rejection of independent claim 1 as allegedly unpatentable over the Reed patent in view of the Cloke patent is respectfully traversed. Claim 1 recites a disk drive including rotating magnetic media having tracks identified by binary codewords. Each track codeword for a particular track within a contiguous band of tracks differs from a track codeword for an adjacent track within the contiguous band of tracks by a defined number N of bits, and differs from a track codeword for a nonadjacent track within the contiguous band of tracks by at least the defined number N of bits. The defined number N of bits is greater than four such that at least two bit errors can be corrected when reading a track codeword.

As discussed with the Examiner during the interview, exemplary bit differences between the adjacent and nonadjacent track codewords are shown in Figures 4-7 of the specification, which are reproduced below:

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TID	CODEWORD (15,7)														
19	0	0	1	1	0	1	0	1	0	1	0	1	0	1	0
20	0	0	1	1	1	1	0	0	0	0	0	1	1	1	1
D = 5	-	-	-	-	X	-	-	X	-	X	-	-	X	-	X

FIG. 4

TID	CODEWORD (15,7)														
19	0	0	1	1	0	1	0	1	0	1	0	1	0	1	0
21	0	0	1	1	1	1	1	1	0	0	1	1	0	0	1
D = 6	-	-	-	-	X	-	X	-	-	X	X	-	-	X	X

FIG. 5

TID	CODEWORD (15,7)														
19	0	0	1	1	0	1	0	1	0	1	0	1	0	1	0
94	1	1	1	0	0	0	1	0	1	1	0	1	0	0	1
D = 9	X	X	-	X	-	X	X	X	X	-	-	-	-	X	X

FIG. 6

TID	CODEWORD (15,7)														
93	1	1	1	0	0	1	1	1	0	1	0	1	0	1	0
94	1	1	1	0	0	0	1	0	1	1	0	1	0	0	1
D = 5	-	-	-	-	-	X	-	X	X	-	-	-	-	X	X

FIG. 7

Figures 4 and 7 show exemplary bit differences between adjacent track code words. In each case, the bit difference (D) between the adjacent track codewords is equal to 5. Figures 5 and 6 show exemplary bit differences between nonadjacent track codewords. In each case, the bit difference (D) between nonadjacent track codewords is greater than or equal to 5.

The codeword distance or bit difference (D) properties set forth in the embodiments of the present invention are particularly advantageous for encoding track identification TID numbers in a disk drive 10. Sampled data techniques such as partial response with maximum likelihood detection (PRML) are applied to data read from the magnetic disk to increase recording densities. Maximum likelihood detection is performed in real time using a Viterbi sequence detector. An error in the maximum likelihood detection generally causes multiple bit

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errors. Considerable competitive advantage may be provided to a disk drive which uses TID

numbers that have a generalized Gray code property of a fixed number N of bit transitions (or a

fixed distance) between each adjacent codeword, <u>and</u> that allow correction of at least two bit

errors when reading a track codeword.

The Reed patent discloses a code capable of correcting a single bit error in a detected

servo track address codeword for correction to one of the adjacent track address codewords. A

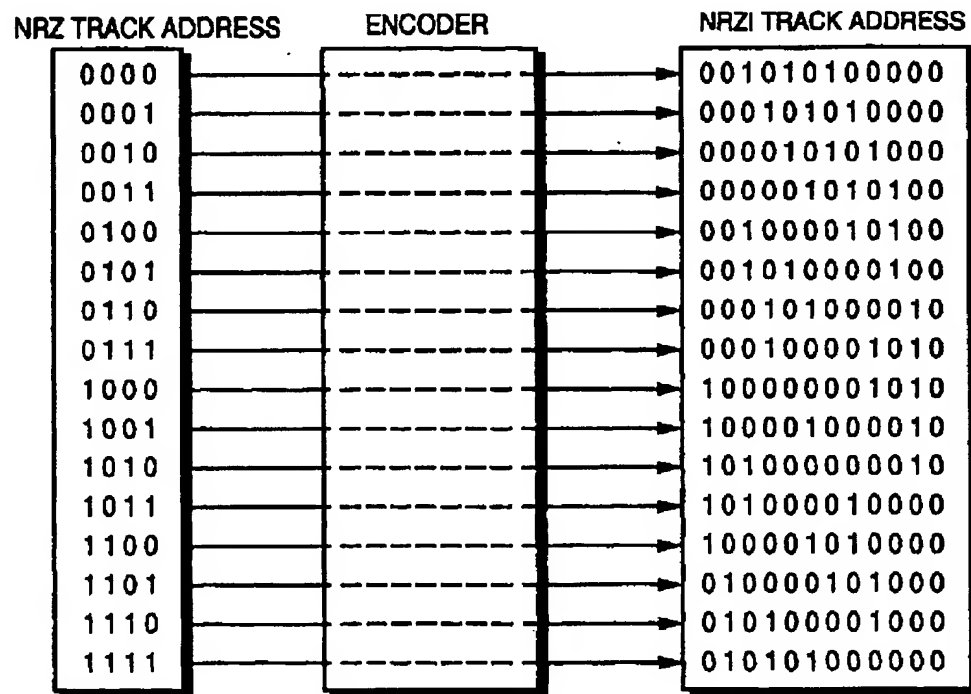codeword list is shown in Figure 7 of the Reed patent, which is reproduced below:

NRZ TRACK ADDRESS	ENCODER	NRZI TRACK ADDRESS
0 0 0 0		0 0 1 0 1 0 1 0 0 0 0 0
0 0 0 1		0 0 0 1 0 1 0 1 0 0 0 0
0 0 1 0		0 0 0 0 1 0 1 0 1 0 0 0
0 0 1 1		0 0 0 0 0 1 0 1 0 1 0 0
0 1 0 0		0 0 1 0 0 0 0 1 0 1 0 0
0 1 0 1		0 0 1 0 1 0 0 0 0 1 0 0
0 1 1 0		0 0 0 1 0 1 0 0 0 0 1 0
0 1 1 1		0 0 0 1 0 0 0 0 1 0 1 0
1 0 0 0		1 0 0 0 0 0 0 0 1 0 1 0
1 0 0 1		1 0 0 0 0 1 0 0 0 0 1 0
1 0 1 0		1 0 1 0 0 0 0 0 0 0 1 0
1 0 1 1		1 0 1 0 0 0 0 1 0 0 0 0
1 1 0 0		1 0 0 0 0 1 0 1 0 0 0 0
1 1 0 1		0 1 0 0 0 0 1 0 1 0 0 0
1 1 1 0		0 1 0 1 0 0 0 0 1 0 0 0
1 1 1 1		0 1 0 1 0 1 0 0 0 0 0 0

FIG. 7

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An examination of the bit differences between adjacent codewords in Figure 7 illustrates a disclosure deficiency in the Reed patent with respect to claim 1. As an example, the bit difference (D) between track address 3 (0011) and adjacent track address 4 (0100) is only 2. This bit comparison is shown below:

TID	NRZI TRACK ADDRESS											
3	0	0	0	0	0	1	0	1	0	1	0	0
4	0	0	1	0	0	0	0	1	0	1	0	0
D = 2	-	-	X	-	-	X	-	-	-	-	-	-

FROM REED FIG. 7

Likewise, the bit difference between track address 10 (1010) and adjacent track address 11 (1011) is only 2. This bit comparison is shown below:

TID	NRZI TRACK ADDRESS											
10	1	0	1	0	0	0	0	0	0	0	1	0
11	1	0	1	0	0	0	0	1	0	0	0	0
D = 2	-	-	-	-	-	-	-	X	-	-	X	-

FROM REED FIG. 7

Thus, the Reed patent fails to disclose or suggest track codewords wherein each codeword for a particular track within a contiguous band of tracks differs from a track codeword for an adjacent track within the contiguous band of tracks by a defined number N of bits and the defined number N of bits is greater than 4, as recited in claim 1. The Cloke patent likewise fails to disclose or suggest track codewords wherein each codeword for a particular track within a contiguous band of tracks differs from a track codeword for an adjacent track within the contiguous band of tracks by a defined number N of bits and the defined number N of bits is greater than 4.

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In the Office Action, reference is made to Figure 4 of the Reed patent. However, the code disclosed in Figure 4 is only "capable of correcting a single bit error in a detected codeword." See, column 3, lines 44-50. The Cloke patent discloses that it is possible to correct more than one bit errors, but the Cloke patent fails to disclose or suggest a codeword list capable of such corrections while maintaining the bit difference properties between adjacent and nonadjacent codewords.

Further, the combination of the Reed and Cloke patents would not enable one of skill in the art to create the disk drive and the codewords claimed in claim 1. Merely combining two references that suggest certain _desired_ properties for track codewords fails to render obvious a disk drive comprising track codewords having these (and other) properties because the two references (separately or in combination) do not comprise an enabling disclosure. _See_ M.P.E.P. § 2144.08(II)(B) (p. 2100-159), _and In re Hoeksema_, 399 F.2d 269, 274 (CCPA 1968).

Thus, the Cloke and Reed patents, taken singly or in combination, cannot render obvious the disk drive of claim 1. Accordingly, claim 1 should now be allowed.

The rejections of claims 2-5, which depend on independent claim 1, as allegedly unpatentable over the Reed patent in view of the Cloke patent are respectfully traversed. Claim 2 recites that the defined number of bits N is 7, which feature is not disclosed in the Reed patent or in the Cloke patent. Similarly, claim 3 recites that the defined number of bits N is 5. Accordingly, for these reasons and the reasons recited with respect to independent claim 1, dependent claims 2-5 define patentable advances over the Reed and Cloke patents, and the rejections of claim 2-5, under 35 U.S.C. § 103(a), should now be withdrawn.

The rejection of independent claim 6 as allegedly unpatentable over the Reed patent in view of the Cloke patent is respectfully traversed. Claim 6 recites a method for identifying tracks on a rotating magnetic media of a disk drive, comprising assigning each track within a contiguous band of tracks with a unique binary codeword such that each track codeword for a particular track within the contiguous band of tracks differs from a track codeword for an

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adjacent track within the contiguous band of tracks by a defined number N of bits, and differs

from a track codeword for a nonadjacent track within the contiguous band of tracks by at least

the defined number N of bits, wherein the defined number N of bits is greater than four such that

at least two bit errors can be corrected when reading a track codeword. For reasons similar to

those discussed above with respect to claim 1, Applicants respectfully submit that the rejection

over the Reed and Cloke patents should be withdrawn. In particular, the combination of the

Reed and Cloke patents do not teach or suggest the claimed method and would not enable one

skilled in the art to practice the claimed method, and therefore the combination cannot render

Claim 6 obvious. *See* M.P.E.P. § 2144.08(II)(B) (p. 2100-159), *and In re Hoeksema*, 399 F.2d

269, 274 (CCPA 1968).

    The rejections of claims 7-10, which depend on independent claim 6, as allegedly

unpatentable over the Reed patent in view of the Cloke patent are respectfully traversed. Claim 7

recites that the defined number of bits N is 7, which feature is not disclosed in the Reed patent or

in the Cloke patent. Similarly, claim 8 recites that the defined number of bits N is 5.

Accordingly, for these reasons and the reasons recited with respect to independent claim 6,

dependent claims 7-10 define patentable advances over the Reed and Cloke patents, and the

rejections of claim 7-10, under 35 U.S.C. § 103(a), should now be withdrawn.

    The rejection of dependent claim 11 as allegedly unpatentable over the Reed patent in

view of the Cloke patent is respectfully traversed. As discussed in the interview, claim 11, which

depends on claim 6, recites that "each track codeword differs from all other track codewords for

nonadjacent tracks within the contiguous band of tracks by at least the defined number N of bits."

Applicants assert that the Office Action fails to address, or even discuss, the features recited in

claim 11, which claim was added as a new claim in the Applicants' last response. Accordingly, a

final rejection of claim 11 is premature.

    Further, an examination of the bit differences between nonadjacent codewords in Figure 7

illustrates that the Reed patent fails to disclose the features recited in claim 11. For example, the

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bit difference between track address 3 (0011) and nonadjacent track address 12 (1100) is only 2. This bit comparison is shown below:

TID	NRZI TRACK ADDRESS											
3	0	0	0	0	0	1	0	1	0	1	0	0
12	1	0	0	0	0	1	0	1	0	0	0	0
D = 2	X	-	-	-	-	-	-	-	-	X	-	-

FROM REED FIG. 7

Likewise, the bit difference between track address 5 (0101) and nonadjacent track address 10 (1010) is only 4. This bit comparison is shown below:

TID	NRZI TRACK ADDRESS											
5	0	0	1	0	1	0	0	0	0	1	0	0
10	1	0	1	0	0	0	0	0	0	0	1	0
D = 4	X	-	-	-	X	-	-	-	-	X	X	-

FROM REED FIG. 7

Thus, the Reed patent fails to disclose or suggest track codewords wherein each track codeword differs from all other track codewords for nonadjacent tracks within the contiguous band of tracks by at least the defined number N of bits and the defined number N of bits is greater than 4, as recited in claim 11. The Cloke patent likewise fails to disclose or suggest track codewords wherein each track codeword differs from all other track codewords for nonadjacent tracks within the contiguous band of tracks by at least the defined number N of bits and the defined number N of bits is greater than 4. Accordingly, for these reasons, and the reasons given above with respect to claim 6, the Cloke and Reed patents, taken singly or in combination, cannot render obvious the method of dependent claim 11. Accordingly, claim 11 should now be allowed.

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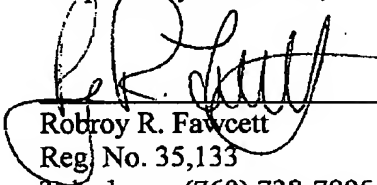Application No.: 10/769,143
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The rejection of dependent claim 12 as allegedly unpatentable over the Reed patent in view of the Cloke patent is respectfully traversed. Similar to claim 11, claim 12, which depends on claim 1, recites that "each track codeword differs from all other track codewords for nonadjacent tracks within the contiguous band of tracks by at least the defined number N of bits." Accordingly, for reasons similar to those given above with respect to claims 1 and 11, the Cloke and Reed patents, taken singly or in combination, cannot render obvious the disk drive of dependent claim 12. Accordingly, claim 12 should now be allowed.

CONCLUSION

In view of the above remarks, this application should now be in condition for allowance. If any questions or issues remain, the Examiner is invited to contact the undersigned at the telephone number set forth below so that prosecution of this application can proceed in an expeditious fashion.

Respectfully submitted,

Date: June 6, 2006

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